

IN THE UNITED STATES DISTRICT COURT  
FOR THE SOUTHERN DISTRICT OF TEXAS  
HOUSTON DIVISION

---

EXXON MOBIL CORPORATION,	)	
	)	
Plaintiff,	)	
	)	
v.	)	Civil Action Nos. H-10-2386 (LHR)
	)	H-11-1814 (LHR)
UNITED STATES OF AMERICA,	)	
	)	
Defendant.	)	
	)	

---

**PLAINTIFF EXXON MOBIL CORPORATION'S MOTION TO EXCLUDE EXPERT OPINIONS AND TESTIMONY OF DR. JAMES R. KITTRELL**

Daniel M. Steinway (S.D. Tex. No. 1105349)  
Attorney in Charge  
Michael McGovern (S.D. Tex. No. 1095459)  
Martha S. Thomsen (admitted *pro hac vice*)  
BAKER BOTTS L.L.P.  
700 K Street, N.W.  
Washington, D.C. 20001  
Telephone: 202.639.7700  
Facsimile: 202.639.7890  
daniel.steinway@bakerbotts.com  
michael.mcgovern@bakerbotts.com  
martha.thomsen@bakerbotts.com

Tynan Buthod (S.D. Tex. No. 14036)  
910 Louisiana  
Houston, TX 77002-1234  
Telephone: 713.229.1912  
Facsimile: 713.229.2712  
ty.buthod@bakerbotts.com

*Counsel for Exxon Mobil Corporation*

February 11, 2020

## TABLE OF CONTENTS

	Page
I. INTRODUCTION AND SUMMARY OF ARGUMENT .....	1
II. SUMMARY OF DR. KITTRELL'S OPINIONS .....	2
III. NATURE AND STAGE OF PROCEEDING .....	4
IV. STANDARD OF REVIEW .....	5
V. ARGUMENT .....	6
A. Dr. Kittrell's Theories of Refinery Operations are Unsubstantiated and Unreliable.....	6
1. The "back-end" theory of refinery operations has been debunked and, in any event, is based on a fundamental misconception of history and refinery processes. ....	6
(a) The Government's demands to maximize production of avgas and other war-products is well-documented. ....	7
(b) All refinery operations during World War II were driven by the Government's demands to maximize the production of avgas.....	8
(c) Dr. Kittrell's opinions ignore key facts and have been rejected by numerous courts.....	10
2. Kittrell's opinions with respect to imports are based on numerous, unsupportable assumptions at odds with both standard (and wartime) refinery practices and the historical setting, rendering his opinion unreliable and inadmissible. ....	13
(a) Dr. Kittrell's "hierarchical rule" is unfounded and renders his ultimate opinions unreliable.....	14
(b) Dr. Kittrell makes key mistakes in his fundamental assumptions about NG&C composition and processing.....	16
(c) In any event, to the extent imported intermediates/components were used in the production of avgas, their processing would have contributed to on-site contamination.....	17
VI. CONCLUSION.....	18

**TABLE OF AUTHORITIES**

CASES	PAGE(S)
<i>Claar v. Burlington N. R.R.</i> , 29 F.3d 499 (9th Cir. 1994) .....	6
<i>Daubert v. Merrell Pharm., Inc.</i> , 509 U.S. 579 (1993).....	5
<i>El Aguila Food Prod., Inc. v. Gruma Corp.</i> , 301 F. Supp. 612 (S.D. Tex. 2003) .....	6
<i>Exxon Mobil Corp. v. United States</i> , 108 F. Supp. 3d 486 (S.D. Tex. 2015) .....	7
<i>Exxon Mobil Corp. v. United States</i> , 335 F. Supp. 3d 889 (S.D. Tex. 2018) .....	4, 6, 11, 12
<i>Gen. Elec. Co. v. Joiner</i> , 522 U.S. 136 (1997).....	6, 13, 14, 15, 16, 18
<i>Kumho Tire Co. v. Carmichael</i> , 526 U.S. 137 (1999).....	5
<i>Mathis v. Exxon Corp.</i> , 302 F.3d 448 (5th Cir. 2002) .....	5
<i>Moore v. Ashland Chem., Inc.</i> , 151 F.3d 269 (5th Cir. 1998) (en banc) .....	6
<i>Shell Oil Co. v. United States</i> , 130 Fed. Cl. 8 (2017), <i>aff'd</i> , 896 F.3d 1299 (Fed. Cir. 2018).....	8, 9, 10, 11
<i>Shell Oil Co. v. United States</i> , 751 F.3d 1282 (Fed. Cir. 2014).....	7
<i>Shell Oil Co. v. United States</i> , 896 F.3d 1299 (Fed. Cir. 2018).....	11
<i>United States v. Shell Oil Co.</i> , 13 F. Supp. 2d 1018 (C.D. Cal. 1998), <i>aff'd</i> , 294 F.3d 1045 (9th Cir. 2002).....	12
<b>OTHER AUTHORITIES</b>	
Fed. R. Evid. 702 .....	2, 5

EPA, <i>Preliminary Data Summary for the Petroleum Refining Category</i> , EPA 821-R-96-015 (Apr. 1996).....	18
EPA, <i>Technical Support Document for the 2004 Effluent Guidelines Program Plan</i> , EPA 821-R-04-014 EPA (Aug. 2004) .....	18

## I. INTRODUCTION AND SUMMARY OF ARGUMENT<sup>1</sup>

Dr. Kittrell has advanced six expert reports in this litigation summarizing his opinions. All six of his reports are based on debunked and unreliable theories of refinery operations, which do not reflect the realities of running refineries and have since been rejected by this Court and several others. In effect, Dr. Kittrell's opinions are nothing more than hypothetical spreadsheet exercises designed to inflate the amount of wartime aviation gasoline ("avgas") produced from imported intermediate materials, natural gasoline and condensate. Dr. Kittrell then argues that such avgas (about half, in his opinion) would have generated little on-site contamination attributable to the Government.

Dr. Kittrell's opinions are based on flawed assumptions, ignore contrary evidence, and are ultimately deeply unreliable; his analytical methodology for determining pollution is based on ill-founded assumptions of how refineries operate. For instance, Dr. Kittrell ignores the entire wartime emergency situation and the fact that the Baytown and Baton Rouge Refineries had to process all of their allotted crude oil on-site to maximize the production of avgas. As a threshold problem, his basic calculations are inaccurate because Dr. Kittrell failed to take into account the key material needed to make avgas: crude oil. Nor, as Dr. Kittrell has admitted, did he take into account the key fact that both of these vital avgas refineries during World War II produced a significant amount of avgas components that were exported elsewhere. Specifically, his opinions are based on a methodology that just fails to recognize several of the most fundamental aspects of wartime refinery operations.

---

<sup>1</sup> Pursuant to Local Rule 7.1, Plaintiff's counsel informed Defendant's counsel about this motion. Counsel could not agree regarding the disposition of this motion.

He further admits that he has no basis to assume – as he does – that all imported materials that could have been used in the production of avgas were used in the production of avgas. And finally, his own figures show that while distillation and cracking account for the majority of on-site contamination, other processing units and departments account for approximately one-third of contamination and the on-site processing of imported intermediates or components into avgas would have produced contamination, a key element that must be included in any acceptable methodology attempting to model how these refineries operated during the wartime.

To date, all courts that have addressed refinery wartime claim cases have rejected the view Dr. Kittrell is proffering of how avgas had to be made. Contrary to his position, these courts have recognized that refineries had to distill and crack all of their allotted crude oil in order to make the base stock for avgas, and that this would always result in the production of by-products. These courts have therefore viewed crude oil—and not any imported components—as the “limiting factor” that drove the overall production of avgas.

Accordingly, Dr. Kittrell’s testimony should be excluded as unreliable and unfounded under Federal Rule of Evidence 702. Further, to the extent Dr. Kittrell makes any last-minute attempt to provide any new testimony, that testimony should be struck.

## **II. SUMMARY OF DR. KITTRELL’S OPINIONS**

Dr. Kittrell issued his initial report on August 10, 2012 (“2012 Kittrell Rpt.”) in this litigation (attached as Exhibit 1) and issued an initial report (“2015 Kittrell Rpt.”) in the related contract actions (attached as Exhibit 15).<sup>2</sup> He also issued four rebuttal reports in 2012, 2013, 2016, and 2017 (attached as Exhibit 2-5) (the 2012, 2013, 2016, and 2017 “Kittrell Reb. Rpts.”).

---

<sup>2</sup> *Exxon Mobil Corp. v. United States*, No. 09-165, No. 09-882 (Fed. Cl.).

Collectively, the primary opinions in his reports—all of which Exxon seeks to exclude—can be summarized as follows.

The overall refining process starts by distilling the crude oil into fractions, which are converted into unfinished intermediate products and ultimately into finished products like avgas, toluene, motor gasoline, fuel oil, and others. However, according to Dr. Kittrell, “[t]he final step of conversion of unfinished intermediate products into finished products such as gasoline does not generally introduce substantial sludge or other elements of site contamination[.]” This factor is a fundamental basis for his ill-founded methodology, and is quite at odds with the accepted science. *See, infra*, Section I.B.3.

Moreover, since again, according to Dr. Kittrell - Baytown and Baton Rouge imported some intermediate products from other refineries, all of these imported intermediates or components (as well as natural gasoline and condensate, or NG&C) had to be first used in the production of avgas at Baytown and Baton Rouge, regardless of what other intermediates or components had already been produced at the refinery. Exhibit 1, 2012 Kittrell Rpt. at 4-6, 8, 19; Exhibit 6, Kittrell Dep. 155:21-25, 156:1-8 (Apr. 29, 2015). Thus, according to Dr. Kittrell, even if some of the octane-boosting enhancement agents had been produced at the plant—and were ready and available for use to make avgas—they would *not* have been used first to make avgas at either Baytown or Baton Rouge because the imported materials would have been used first instead. And again, according to Dr. Kittrell, these imported materials would have been used first even if they were not “hot,” in spite of the fact that the refineries generally would have used “hot” materials first that were ready-made at the plant—for the sake of efficiency. Accordingly, Dr. Kittrell asserts that only half of the pollution associated with the production of avgas occurred on-site, ignoring the fact that crude oil had to be distilled and cracked at the plant as well. *See Exhibit 1*, 2012 Kittrell Rpt. at 36-38; 42-43. Further, according to Dr. Kittrell,

avgas was itself only a small percentage of the final products refined at Baytown and Baton Rouge, so only a small portion of contamination on-site generated during the wartime period was related to the Government's directives to maximize the production of avgas.<sup>3</sup> See, e.g., Exhibit 2, 2012 Kittrell Reb. Rpt. at 15, 23, 27-28.

Three common themes underlie Dr. Kittrell's opinions:

1. Waste and contamination stemming from refinery operations are readily severable such that waste could be attributable to specific, non-avgas products, notwithstanding the fact that the refineries were under Government directive to maximize avgas production and had to process all of their allotted crude oil to do so.
2. Because some of the intermediate products used in the production of avgas at Baytown and Baton Rouge were produced at other facilities, only a portion of the contamination associated with the production of avgas was released on-site at the Baytown and Baton Rouge facilities specifically.
3. Imported intermediates/components (and natural gas) would have been preferentially used in the production of avgas, despite the availability of on-site crude-sourced materials.

As discussed below, each of these theories is wholly unfounded. Dr. Kittrell's methodology is based on these fundamentally ill-founded assumptions and principles and cannot be used as a basis for allocation.

### **III. NATURE AND STAGE OF PROCEEDING**

This Court previously resolved two sets of cross-motions for summary judgment. Several issues remain for trial, which is scheduled to begin on March 2, 2020. Issues remaining for trial include, most notably, the allocation of responsibility between the parties for the cleanup costs at Baytown and Baton Rouge. Exxon expects that the Government intends to present Dr.

---

<sup>3</sup> Dr. Kittrell's analysis also ignores the fact that many other products were also produced for the war effort, not just avgas. See *Exxon Mobil Corp. v. United States*, 335 F. Supp. 3d 889, 940-41 (S.D. Tex. 2018).

Kittrell as an expert witness at trial, unless this Court grants the instant motion in limine to preclude his testimony.

#### **IV. STANDARD OF REVIEW**

The Federal Rules of Evidence “assign to the trial judge the task of ensuring that an expert’s testimony both rests on a reliable foundation and is relevant to the task at hand.” *Daubert v. Merrell Pharm., Inc.*, 509 U.S. 579, 597 (1993). Expert testimony must be excluded when it is not a product of reliable principles and methods applied to sufficient facts and data.

Federal Rule of Evidence 702 provides that:

A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if: (a) the expert’s scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue; (b) the testimony is based on sufficient facts or data; (c) the testimony is the product of reliable principles and methods; and (d) the expert has reliably applied the principles and methods to the facts of the case.

Fed. R. Evid. 702. In sum, Rule 702, *Daubert*, and *Kumho* embody three guidelines for expert testimony: qualification, reliability, and helpfulness or fit. *See Mathis v. Exxon Corp.*, 302 F.3d 448, 459-60 (5th Cir. 2002) (reviewing expert testimony for qualification, reliability, and relevance); *see also Kumho Tire Co. v. Carmichael*, 526 U.S. 137 (1999).

With respect to reliability, the ultimate issue before the Court is if an expert, “whether basing testimony upon professional studies or personal experience, employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field.” *Kumho*, 526 U.S. at 152. The Supreme Court listed several specific factors that a trial judge may consider in admitting scientific or other testimony, *see Daubert*, 509 U.S. at 592-94, including whether the proposed theory can be tested, has been peer reviewed, and/or has received general acceptance. These factors do not, however, “constitute a ‘definitive checklist or test,’” *Kumho*, 526 U.S. at 150 (quoting *Daubert*, 509 U.S. at 593). For instance, where “there is simply too

great an analytical gap between the data and the opinion proffered,” the Supreme Court held that an expert opinion should be excluded. *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 146 (1997). The Fifth Circuit has upheld the exclusion of expert testimony when the analytical gap between the proffered expert testimony and the underlying data “was too wide.” *Moore v. Ashland Chem., Inc.*, 151 F.3d 269, 279 (5<sup>th</sup> Cir. 1998) (en banc); *id.* at 276 (“a district court, while acting as a gatekeeper for expert evidence, must evaluate whether there is an adequate ‘fit’ between the data and the opinion proffered.”). “In other words, there must be a connection between the expert’s opinion and the fact testimony.” *El Aguila Food Prod., Inc. v. Gruma Corp.*, 301 F. Supp. 612, 619 (S.D. Tex. 2003). Similarly, expert testimony should be excluded where the expert has failed to adequately account for obvious alternative explanations. *See, e.g., Claar v. Burlington N. R.R.*, 29 F.3d 499, 502 (9th Cir. 1994).

In short, a proffered expert’s testimony is unreliable and must be excluded when it fails to consider relevant data or there is too great a leap between the data and the opinions offered.

## V. ARGUMENT

### A. Dr. Kittrell’s Theories of Refinery Operations are Unsubstantiated and Unreliable.

1. The “back-end” theory of refinery operations has been debunked and, in any event, is based on a fundamental misconception of history and refinery processes.

This Court has already ruled that the “the United States is responsible for its equitable share of cleanup costs related to wartime non-avgas products that were produced in conjunction with the avgas production.” *Exxon Mobil Corp. v. United States*, 335 F. Supp. 3d 889, 944 (S.D. Tex. 2018) (“*Exxon IP*”). Yet, a key tenet of Dr. Kittrell’s report is that some fixed percentage of the crude processed at Baytown and Baton Rouge can be “assigned” to the production of avgas and potentially other war products, while the rest is attributable to other non-war products; this view is based on an assumed approach for how these refineries operated. This assumption has

been fundamentally debunked by this Court and others because it ignores the chemistry and processes associated with the production of avgas, and also ignores the World War II history and the directives issued to Exxon to maximize avgas production.

**(a) The Government's demands to maximize production of avgas and other war-products is well-documented.**

Copious wartime records demonstrate the Government's control over refining operations during the World War II era. As the U.S. Court of Appeals for the Federal Circuit found, “[a]t the time the [avgas] contracts were signed, the Government exercised substantial wartime regulatory control over almost every aspect of the petroleum industry.” *Shell Oil Co. v. United States*, 751 F.3d 1282, 1285 (Fed. Cir. 2014) (“*Shell III*”). Similarly, and as this Court has previously noted, “the federal government . . . control[ed] the type and amount of crude oil and other raw materials sent to [Baytown and Baton Rouge]. This was part of the approach that treated all the nation’s refineries as ‘units in one vast national refinery.’” *Exxon Mobil Corp. v. United States*, 108 F. Supp. 3d 486, 498 (S.D. Tex. 2015) (“*Exxon I*”).

The Government exercised this control to maximize the production of avgas and other war products. Historical government documents “laid out seven steps for meeting avgas requirements, including ‘[f]orc[ing] each refining operating unit to its maximum output.’” *Exxon I*, 108 F. Supp. 3d at 499 (alterations in original). “Facilities that accepted such obligatory product orders had to prioritize government military contracts above all other contracts. To the extent facilities relied on scarce raw materials, the Government could regulate supply chains to ensure continuing production.” *Shell III*, 751 F.3d at 1285 (citation omitted).

Contemporaneous journals also chronicled the extensive power exercised by the Government over the petroleum industry during this time. By December 1941, “[t]he Government took complete control of the aviation-gasoline industry through a formal

‘recommendation’ from Petroleum Coordinator Harold L. Ickes which is tantamount to a mandatory order[.]” Exhibit 7, Henry D. Ralph, *Industry Being Geared for Wartime Requirements*, 40 Oil & Gas J. 16, 16 (Dec. 18, 1941). Under this program refineries were required to distill and crack all of their crude oil supplies to maximize the production of avgas. See PAW Recommendation No. 16 (Exhibit 16).

Thus, the record demonstrates that the United States wielded considerable control over the refining industry and exercised this authority to maximize the production of avgas and other products during wartime. In turn, the need to maximize production of avgas “drove” individual plant operations, a crucial fact ignored by Dr. Kittrell and a key part of any reliable methodology that should be considered in this case. Moreover, as a technical matter, the Government’s mandate to maximize the production of avgas had the effect of formally requiring all refinery systems and processes at these plants to be converted to the production of avgas—regardless of how much avgas could be produced on a daily basis, and to use all of the crude oil available. This factor is not reflected in Dr. Kittrell’s methodology; the analytical gap between the facts and the Kittrell methodology renders his opinions too unreliable to be admitted.

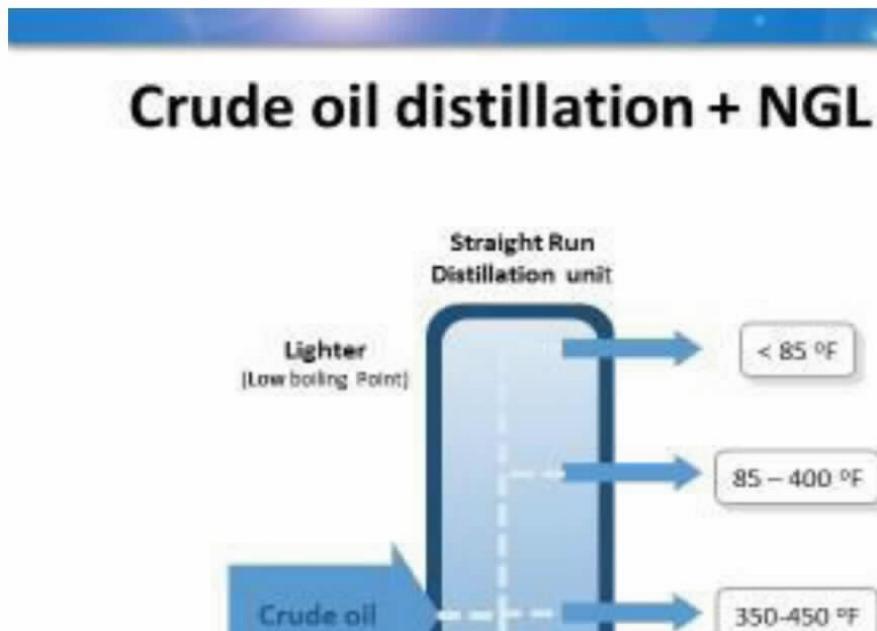
**(b) All refinery operations during World War II were driven by the Government’s demands to maximize the production of avgas.**

Basic refining principles dictate that in order to meet the Government’s wartime demands, all refinery operations—in particular, the initial processing of crude oil—were driven by avgas production.

In *Shell Oil Co. v. United States*, 130 Fed. Cl. 8 (2017) (“*Shell II*”), *aff’d*, 896 F.3d 1299 (Fed. Cir. 2018), the court outlined the following concise description of basic crude refining operations. Notably, this description was based on the input of Dr. Kittrell as well as one of Exxon’s expert in this case, Mr. Greg Kipp:

When crude oil arrives at a refinery it is sent to a distillation tower, where it is subjected to extreme heat that breaks down crude oil into constituent hydrocarbons—the heaviest of which settle near the bottom of the tower, while the lighter hydrocarbons rise to the top, according to their boiling points. . . . Hydrocarbons that reached a boiling between 100° F and 295° F were used to make avgas. But, other petroleum by-products, such as kerosene and heating oil, also could be converted into the lighter hydrocarbons and used in avgas production through a process known as “cracking.”

130 Fed. Cl. at 21 (citation omitted). The court referenced the following figure from Dr. Kittrell’s report, depicting the separation of distillates in the distillation process:



In brief, the initial distillation of crude yields a series of distillates of different characteristics, some but not all of which can be used in the production of avgas (immediately or through further processing, *i.e.*, “cracking”). Dr. Kittrell’s own figure above demonstrates this fact. Accordingly, it is technically impossible to produce avgas without making other by-products—which the Government actually recognized in the avgas production contracts during the wartime era. *See Exhibit 8*, Agreement between Defense Supplies Corporation and Standard

Oil Company of New Jersey, at 11 (Jan. 13, 1942). (“[S]ubstantial quantities of motor fuel and other products must necessarily be produced and sold in connection with the production of 100-Octane aviation gasoline”).

Put another way, it was necessary to process all of the crude shipped to both refineries to meet the Government’s demands to maximize the production of avgas and other war products. Crude oil processed on-site was the primary limiting factor in how much avgas could be produced. In fact, Dr. Kittrell agreed that all of the crude had to be “run” for the production of avgas. *See Exhibit 9*, Kittrell Dep. 111:5-113:12 (March 30, 2017).

None of these basic refinery principles are reflected in his methodology. Thus, his attempts to parse out a percentage of crude and/or contamination attributable to other products ignores these basic tenets of refining, including his own description of refining operations.

**(c) Dr. Kittrell’s opinions ignore key facts and have been rejected by numerous courts.**

As a result of the aforementioned key facts—all ignored by Dr. Kittrell—all of the courts that have addressed refinery wartime claims to date have held the Government responsible for the cleanup of all by-products that were generated to meet the Government’s mandates. Specifically, the U.S. Court of Appeals for the Federal Circuit, as well as the U.S. Court of Federal Claims (twice) and U.S. District Court for the District of Central California, have found that the Government’s demands for maximum production of avgas rendered the Government responsible for all resulting waste, even where some non-avgas products were produced. For example, in *Shell II*, the court ruled that the United States was responsible for all of the “acid waste disposed of at the McColl Site [that] was caused by the increased avgas production and need to maximize the manufacture and sale of non-avgas petroleum by-products.” 130 Fed. Cl.

at 35-36.<sup>4</sup> This decision was affirmed by the Federal Circuit, which concluded that “the production of waste from non-avgas products ‘began as sulfuric acid that was catalyzed with crude oil during the process to create avgas and became spent alkylation acid in need of waste disposal.’” *Exxon II*, 335 F. Supp. 3d at 943 (quoting *Shell Oil Co. v. United States*, 896 F.3d 1299, 1309 (Fed. Cir. 2018) (“*Shell IV*”)). In upholding the lower court’s decision, the Federal Circuit noted that:

The Court of Federal Claims did not clearly err in its determination regarding acid sludge from non-avgas products. All acid sludge created from the production of non-avgas components, such as motor fuel, began as sulfuric acid that was catalyzed with crude oil during the process to create avgas and became spent alkylation acid in need of waste disposal. Thus, even if the acid sludge was a secondary waste product, it is still directly related to the initial reaction used to create avgas under the Avgas Contracts.

*Shell IV*, 896 F.3d at 1309 (citations omitted).

<sup>4</sup> In fact, the court in *Shell II* specifically debunked the Government’s theories about refinery production and rejected Dr. Kittrell’s view out of hand. 130 Fed. Cl. at 35-36 (The Government’s theory of causation “ignores the relevance of the Government’s obligations in the Avgas Contracts and misstates the but-for causation standard that does not require the Oil Companies to establish that spent alkylation acid and/or acid sludge would not have been produced ‘but for’ the Avgas Contracts—but instead, how much acid waste disposed of at the McColl Site was caused by the increased avgas production and need to maximize the manufacture and sale of non-avgas petroleum by-products—required by the terms of the Avgas Contracts.”).

Here, Dr. Kittrell assumed that pollution attributable to avgas production could have been illustrated by the so-called “Delta theory,” or the incremental amount of additional production capacity employed by the refineries during the war to meet the nation’s need for avgas; However, the wartime new construction list does not, for example, at Baytown list any new pipe stills added to the refinery during the wartime period; rather, the primary major construction items listed for Baytown are new catalytic cracking units or other processing units even though Baytown’s own production of avgas increased substantially during the war. See Exhibit 17, Plaintiff’s Proposed Finding of Fact No. 4 (Table 1 – Baytown Facility) (listing new process units constructed at the Baytown refinery during the war). Without the construction of new pipe stills, plant capacity could not, of course, have been increased in the first place, evidencing the fact that a “Delta-like” approach for evaluating the amount of pollution could not at all have been reliable.

Likewise, the court in *United States v. Shell Oil Co.*, 13 F. Supp. 2d 1018, 1026 (C.D. Cal. 1998) (“*Shell I*”), *aff’d*, 294 F.3d 1045 (9th Cir. 2002), found that the United States was responsible for all of the spent sulfuric acid needed for avgas production, even though some of the acid was reused to manufacture other products. Dr. Kittrell’s analysis flies in the face of these rulings by the Federal Circuit and others, and this Court’s own reasoning when it “agree[d] with the Federal Circuit’s analysis and concludes that the United States is responsible for its equitable share of cleanup costs related to wartime non-avgas products that were produced in conjunction with the avgas production.” *Exxon II*, 335 F. Supp. 3d at 944.

These courts essentially ruled that a “front-end” approach is the most accurate way to characterize World War II refinery operations. Because the Government controlled the “front-end”—*i.e.*, allotted the crude and told the refiners what and how much to make—the Government was responsible for all resulting waste. This Court has already fundamentally adopted that approach when it “agree[d] with the Federal Circuit’s analysis and conclude[d] that the United States is responsible for its equitable share of cleanup costs related to wartime non-avgas products that were produced in conjunction with the avgas production.” *Exxon II*, 335 F. Supp. 3d at 944.

Dr. Kittrell’s theory, by contrast, is a “back-end” products-based approach that assumes specific amounts of waste could be attributed to non-wartime products. Because this theory is based on flawed assumptions about refinery practices, which in some instances are at odd with Dr. Kittrell’s own descriptions as well as the findings of this Court and others, his opinions are ultimately unreliable and should be excluded.

2. **Kittrell's opinions with respect to imports are based on numerous, unsupportable assumptions at odds with both standard (and wartime) refinery practices and the historical setting, rendering his opinion unreliable and inadmissible.**

The logic underpinning Dr. Kittrell's opinions is as follows: (1) “[A] large number of U.S. refineries sent their intermediate products to Exxon refineries to be converted into aviation gasoline or toluene”; (2) “[a]bout half the aviation gasoline and nearly all of the toluene at the Exxon refineries was produced from purchased unfinished raw materials and not Exxon's own crude oil;” (3) additionally, some of the intermediates were produced from natural gasoline rather than crude; therefore, (4) a large portion of the avgas production at Baytown and Baton Rouge “contribut[ed] little to present environmental issues at the refineries.” Exhibit 1, 2012 Kittrell Rpt. at 5, 8, 17 & n. 19, 19-20.

Dr. Kittrell's analysis is based on bald assumptions that are inconsistent with actual refinery practices, again rendering the underpinning of his methodology to be unsubstantiated at the very least. First, inherent in his analysis is a “hierarchical” or “preferential” rule that Exxon's refineries would preferentially use imported intermediates and components over materials sourced from their own refineries. Dr. Kittrell admitted in deposition to having little to support this assumption, which in any event is undercut by basic principles of refinery operations. Since this is a crucial basis for Dr. Kittrell's ultimate opinion that little on-site contamination would be associated with avgas production, the flaw renders his entire opinion unreliable. *See Joiner*, 522 U.S. at 146.

Second and relatedly, Dr. Kittrell erroneously assumes that all natural gasoline and condensate (or NG&C) was used in the production of avgas—meaning that, according to him, some intermediates like isobutane were obtained from natural gasoline rather than crude processing and would further lessen the contamination associated with crude processing for

avgas production. *See* 2012 Kittrell Rpt. at 17 & n. 19. In fact, this assumption ignores the key fact that the Baytown plant used the same amount (or close to the same of amount) of natural gasoline before the war just to run the plant; therefore, this full amount could not all have been converted to use for a different purpose a short time later. *See Exhibit 10*, Expert Report of David B. Lerman, at 26, 28 (Sept. 24, 2015) (“Lerman Rpt.”).

Third and finally, imported intermediate materials, even if ultimately used in the production of avgas, would have also contributed to on-site contamination, contrary to Dr. Kittrell’s claims. Dr. Kittrell’s refusal to acknowledge basic science—as well as statements by Government agencies—render his opinions unreliable and inadmissible. *See Joiner*, 522 U.S. at 146.

**(a) Dr. Kittrell’s “hierarchical rule” is unfounded and renders his ultimate opinions unreliable.**

In effect, Dr. Kittrell’s hierarchical rule assumes that any imports that could have been used for the production of avgas *would* have been used in the production of avgas. This assumption is without basis—as Dr. Kittrell admits in deposition—and is debunked by standard refinery practice.

In deposition, Dr. Kittrell admitted that he had no evidence demonstrating that imports would have been selectively used for the production of avgas:

Q. What is the basis for your opinion that the refinery would have used all the imports first before using product from the refinery, *per se*?

A. Again, that’s the same provision that we talked about for Baton Rouge. These were being arranged and imported for a reason. Somebody, PAW or somebody believes that on balance, this imported stock is desired, and the two companies agree, whatever the mechanism is, but it’s being imported to be used in avgas.

Q. Is there any other basis for your opinion on that point?

A. Nothing comes to mind at the moment.

Exhibit 6, Kittrell 2015 Dep. 155:21-25, 156:1-8.

Further, standard refinery practices and energy balance actually indicate that Baytown and Baton Rouge may have preferred on-site sourced feedstocks over imports for the production of avgas. For instance, Dr. Kittrell assumes that all of the imported fluid catalytic cracking (“FCC”) feedstock would have been preferentially used in the production of avgas at both sites. *See Exhibit 6*, Kittrell 2015 Dep. 50:7-20. FCC feedstock can be used in the production of avgas, but it can also be used in the production of other products, and using the cold imported FCC feedstock in the production of supplemental non-avgas products would have helped save a refinery on energy costs:

The refinery can either heat up the cold imported FCC feedstock to charge to the FCC unit and then cool down the hot rundown gas oil from the [on-site] crude distillation units to blend into heavy fuels. Alternatively, the refinery can save on the energy costs of heating and cooling by charging more of the hot rundown to the FCC unit and use the cold imported FCC feedstock to blend into [other products].

Exhibit 10, Lerman Rpt., at 26.

Finally, Dr. Kittrell does not consider or account for how refineries generally manage inventories and the factors they must take into consideration—including managing quality balances and the logistics of moving materials into and around the refineries. *See Exhibit 10*, Lerman Rpt. 27. Nor does he account for the fact that, in many instances, it would be wholly impractical for a refinery to segregate and distinguish imported feedstocks or intermediates from those sourced on-site; the refinery would not have kept separate tanks for imported and refinery-sourced materials. In short, Dr. Kittrell’s hierarchical rule is a hypothetical spreadsheet exercise that fundamentally misunderstands refinery operations and should be excluded. *See Joiner*, 522 U.S. at 146.

**(b) Dr. Kittrell makes key mistakes in his fundamental assumptions about NG&C composition and processing.**

Dr. Kittrell's methodology also relies on the assumption that virtually all of the natural gasoline used at Baytown and Baton Rouge was directed to the production of aviation gasoline. *See Exhibit 6*, Kittrell 2015 Dep. 62:4-9. As a result, according to Dr. Kittrell, little on-site pollution would have been associated with the production of avgas from these natural gasoline components. *See, e.g., Exhibit 1*, 2012 Kittrell Rpt. at 17 n. 19-20. This assumption is directly contrary to the actual 1939 and 1945 refinery flow diagrams, which show that much of the natural gasoline was used to as fuel to run the refinery units ("Refinery Fuel" in the diagram), and should be excluded. *See Exhibits 11-12*, Refinery Flow Diagrams; *Joiner*, 522 U.S. at 146.

In fact, only a very small amount of natural gasoline could have been used in the production of avgas, and to the extent that some small amount of natural gasoline would have been used in the manufacture of avgas, it still would have been processed in the light ends fractionation unit and therefore generated additional waste. *See Exhibit 13*, Supplemental Expert Report of John Beath at 5 (November 6, 2014).

Natural gasoline has several components, including propane, isobutane, n-butane, isopentane, hexanes & heavier, and others. *See Exhibit 14*, Excerpt from National Petroleum News (July 5, 1944). Hexanes and heavier, in turn, can include hexane, heptane, and octane as well as "iso" isomers of each. *See Exhibit 10*, Lerman Rpt. at 33. The isomers (including isopentane) can be used in the blending of avgas.

Dr. Kittrell concluded that a considerable portion of the natural gasoline components was used in the production of avgas based on several flawed assumptions. First, of the "hexanes and heavier" natural gasoline components, which can comprise 10-20% of natural gasoline, Dr. Kittrell assumes all of it was composed of isomers available for the production of avgas – even

though he had no evidence to support this assumption. *Id.*; Exhibit 4, Kittrell 2016 Reb. Rpt. at 49 Table 1.7. Second, Dr. Kittrell assumes that some portion of the normal pentane (n-pentane) at Baytown would have been isomerized and converted into isopentane such that it could be used for the production of avgas. *See Exhibit 6*, Kittrell 2015 Dep. 157:19-158:4; Exhibit 4, Kittrell 2016 Reb. Rpt. at 47 Table 1.5; Exhibit 10, Lerman Rpt. at 36. Here, Dr. Kittrell candidly admitted that he had no evidence to support his assumption that Baytown's isomerization unit converted pentane into isopentane. *See Exhibit 6*, Kittrell 2015 Dep. 157:19-158:4.

Finally, refinery flow diagrams undercut Dr. Kittrell's assumption that a large majority of natural gasoline components would have been preferentially used in the production of avgas; those diagrams show instead that much of the natural gasoline was used as refinery fuel to run the plant, and that many of the NG&C components actually went to the production of motor gasoline. *See Exhibits 11-12*, Refinery Flow Diagrams; *see also Exhibit 10*, Lerman Rpt. at 38-39 (discussing the diagram). In sum, these assumptions provide a counterfactual, faulty basis for developing the methodology suggested by Dr. Kittrell; they are at wide odds with conventional refinery practices.

**(c) In any event, to the extent imported intermediates/components were used in the production of avgas, their processing would have contributed to on-site contamination.**

The linchpin of Dr. Kittrell's opinions—*i.e.*, the whole reason he spends six reports opining on the amount of imports and natural gasoline utilized in the production of avgas at Baytown and Baton Rouge—is that avgas produced from imported intermediates and natural gasoline would have produced little on-site waste. The hidden assumption is that only distillation and cracking generate on-site waste, while further handling and storage, including of imported intermediates, do not.

Figures cited by Dr. Kittrell himself decimate his own assumption. For instance, Figure 4 in his 2012 rebuttal report shows that departments outside of distillation and cracking generate 32 percent—nearly one third—of all refinery waste. *See Exhibit 2*, 2012 Kittrell Reb. Rpt. at 29. Likewise, Dr. Kittrell assumes that the FCC units when processing imported FCC feedstock produced no more than “de minimis” contamination. *See Exhibit 15*, 2015 Kittrell Rpt. at 17. In fact, Dr. Kittrell’s assumption is contradicted by EPA documents, which find that FCC units are the “largest single source of sour and phenolic wastewater in a large refinery” and contribute about 26 percent of a refinery’s total wastewater load.<sup>5</sup> Accordingly, Dr. Kittrell’s assumption that the processing of imported intermediates would have contributed little to on-site contamination is without basis, rendering his overall opinions about the relationship between Government-demanded avgas production, imported intermediates, and the generation of waste not just unreliable, but ultimately irrelevant and inadmissible, and certainly destroys the foundation for his assumed methodology. *See Joiner*, 522 U.S. at 146.

## VI. CONCLUSION

For all the reasons set forth herein, Exxon Mobil Corporation respectfully requests that the Court grant this motion to exclude the testimony of Dr. Kittrell at the forthcoming bench trial.

---

<sup>5</sup> See EPA, *Preliminary Data Summary for the Petroleum Refining Category*, EPA 821-R-96-015, at 6 (Apr. 1996), [https://www.epa.gov/sites/production/files/2015-10/documents/petro-refining-elg-study\\_1996.pdf](https://www.epa.gov/sites/production/files/2015-10/documents/petro-refining-elg-study_1996.pdf); EPA, *Technical Support Document for the 2004 Effluent Guidelines Program Plan*, EPA 821-R-04-014, at 7-24 Table 7-4 (Aug. 2004), [https://www.epa.gov/sites/production/files/2015-11/documents/2004\\_effluent-guidelines-plan\\_tsd.pdf](https://www.epa.gov/sites/production/files/2015-11/documents/2004_effluent-guidelines-plan_tsd.pdf).

Respectfully submitted,

BAKER BOTTS L.L.P.

/s/ Daniel M. Steinway

Daniel M. Steinway (S.D. Tex. No. 1105349)

Attorney in Charge

Michael McGovern (S.D. Tex. No. 1095459)

Martha S. Thomsen (admitted *pro hac vice*)

700 K Street, N.W.

Washington, D.C. 20001

Telephone: 202.639.7700

Facsimile: 202.639.7890

daniel.steinway@bakerbotts.com

michael.mcgovern@bakerbotts.com

martha.thomsen@bakerbotts.com

Tynan Buthod (S.D. Tex. No. 14036)

910 Louisiana

Houston, TX 77002-1234

Telephone: 713.229.1912

Facsimile: 713.229.2712

ty.buthod@bakerbotts.com

*Counsel for Exxon Mobil Corporation*

**CERTIFICATE OF SERVICE**

I hereby certify that on the 11<sup>th</sup> of February, 2020, I served the foregoing on the following counsel by filing the same via the Court's ECF system:

Michael D. Rowe  
United States Department of Justice  
Environmental Defense Section  
P.O. Box 7611  
Washington, D.C. 20044  
[michael.rowe@usdoj.gov](mailto:michael.rowe@usdoj.gov)

Brian H. Lynk  
United States Department of Justice  
Environmental Defense Section  
P.O. Box 7611  
Washington, D.C. 20044  
[brian.lynk@usdoj.gov](mailto:brian.lynk@usdoj.gov)

Sue Chen  
United States Department of Justice  
Environmental Defense Section  
P.O. Box 7611  
Washington, D.C. 20044  
[sue.chen@usdoj.gov](mailto:sue.chen@usdoj.gov)

Andrew John Corimski, III  
United States Department of Justice  
Environmental Defense Section  
P.O. Box 7611  
Washington, D.C. 20044  
[andrew.corimski@usdoj.gov](mailto:andrew.corimski@usdoj.gov)

Mark Walters  
United States Department of Justice  
Environmental Defense Section  
P.O. Box 7611  
Washington, D.C. 20044  
[mark.walters@usdoj.gov](mailto:mark.walters@usdoj.gov)

*/s/ Tynan Buthod*  
Tynan Buthod